

**Topas® 6013F-04**

Extrusion grade with high temperature resistance for pharmaceutical, medical and food packaging applications. Can be used in coextruded films as a discrete layer or in blends with PE. Provides excellent clarity, high stiffness/modulus, high water vapor barrier properties and good thermoformability.

Cyclic Olefin Copolymer (COC)

Property	Value	Unit	Test Standard
<b>Physical Properties</b>			
Density	1020	kg/m <sup>3</sup>	ISO 1183
Melt volume rate (MVR)	1.0	cm <sup>3</sup> /10min	ISO 1133
MVR test temperature	230	°C	ISO 1133
MVR test load	2.16	kg	ISO 1133
Water absorption (23°C-sat)	0.01	%	ISO 62
<b>Thermal Properties</b>			
Glass transition temperature (10°C/min)	138	°C	ISO 11357-1,-2,-3
<b>Mechanical Properties (Film)</b>			
Tensile modulus (machine direction)	2400	MPa	ISO 527-3
Tensile modulus (transverse direction)	2250	MPa	ISO 527-3
Tensile strength @ break (machine direction)	55	MPa	ISO 527-3
Tensile strength @ break (transverse direction)	45	MPa	ISO 527-3
Elongation at break (machine direction)	2.4	%	ISO 527-3
Elongation at break (transverse direction)	2.2	%	ISO 527-3
Elmendorf tear strength (machine direction)	9	g	ISO 6383-2
Elmendorf tear strength (transverse direction)	9	g	ISO 6383-2
Dart Drop Impact Strength, F50	<36	g	ISO 7765-1
<b>Optical Properties (Film)</b>			
Gloss, 60°	>100	%	ISO 2813
Haze	<1	%	ISO 14782
<b>Barrier Properties (Film)</b>			
Water vapor permeability @ 38°C, 90% RH	1.3	q·100µm/(m <sup>2</sup> ·day)	ISO 15106-3
Oxygen Permeability @23°C, 50%RH	280.0	cm <sup>3</sup> ·100µm/(m <sup>2</sup> ·day·bar)	ASTM D3985
<b>Test Specimen Production (Film)</b>			
Type of extrusion	cast		
Thickness of specimen	0.07	mm	

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